Mischarytera megaphylla P.I.Forst. (Sapindaceae), a new species from the 'Wet Tropics' of north-east Queensland

Paul I. Forster

Summary

Forster, P.I. (2006). *Mischarytera megaphylla* P.I.Forst. (Sapindaceae), a new species from the 'Wet Tropics' of north-east Queensland. *Austrobaileya* 7(2): 279–283. The new species, *Mischarytera megaphylla,* is described and illustrated. It is known from lowland tropical rainforest in a small area at Oliver and Noah Creeks in the 'Wet Tropics' of north-east Queensland. A key to the Australian species of *Mischarytera* is provided.

Key Words: Sapindaceae, *Mischarytera megaphylla*, new species, Wet Tropics biodiversity, Cape Tribulation, Australian flora, Queensland flora, identification key

P.I.Forster, Queensland Herbarium, Environmental Protection Agency, Brisbane Botanic Gardens, Mt Coot-tha Road, Toowong, Queensland 4066, Australia. Email: paul.forster@epa.qld.gov.au

Introduction

The genus *Mischarytera* H.Turner was described in 1995 to accomodate three species from Australia and New Guinea that had been previously included in *Arytera* Blume (Turner 1995). *Mischarytera* was distinguished from *Arytera* by the fruit being glabrous inside (versus glabrous or variously hairy inside) and having a sclerenchymatic layer inside the pericarp that radiates from the placenta and separates from the endocarp when ripe (versus lacking); a punctate calyx with teeth that have a membranous margin (versus lacking); the 3–11-jugate leaves (versus 1–4–(6-) jugate) and leaflets that are densely punctate (versus not, or only sparsely) (Turner 1995). *Arytera* has fruit that always open loculicidally, whereas in *Mischarytera* the fruit open loculicidally or loculifragally, as in the new species described below.

In 1972, Len Webb and Geoff Tracey collected fruiting material of a large leaved Sapindaceae plant at Oliver Creek in the Cape Tribulation area. This collection was tentatively identified as an *Harpullia* sp. by the collectors, then later as *H. vaga* Merr. & Perry by P.W.Leenhouts in 1980 with the note that the "fruit does not belong here!". This small tree has been rarely and irregularly collected at Noah Creek and Oliver Creek in the intervening 30+ years and ended up being listed at BRI as "*Mischarytera* sp. (Oliver Creek L.J. Webb+ 10903)" (Forster & Jessup 2002) and at QRS as "Sapindaceae sp. (Noah Creek BG 6026)" (Hyland *et al.* 2003).

The collection of both flowering and fruiting material of this tree by Bruce Gray has enabled critical examination of both its generic and specific placement. In nearly all respects, this species fulfills the character states necessary for it to be included in *Mischarytera*, *viz.* fruit glabrous inside; calyx punctate, teeth with a membranous margin; leaves 3–11-jugate; leaflets densely punctate. From the very limited fruiting material to hand it does not appear to have the sclerenchymatic layer on the inside of the pericarp that radiates from the placenta and separates from the endocarp when ripe (Turner 1995: 143). The regular occurrence of this layer in the fruits of the species referred to *Mischarytera* requires further study utilising fresh or spirit material as although it was illustrated (from dried material) for *M. lautereriana* (F.M.Bailey) H.Turner by Turner (1995) it appears absent from the illustrations of fresh material of that species and for *M. macrobotrys* (Merr. & L.M.Perry) H.Turner (Cooper & Cooper 1994, 2004).

This new species is named here in *Mischarytera*, although with some reservations. It will be interesting to see where its relationships lie once molecular analyses are undertaken for the *Arytera* – *Mischarytera* group of species

Accepted for publication 27 June 2006

and whether recognition of the latter genus is justified on molecular grounds.

Materials and methods

The data presented in this paper are derived from herbarium collections at BRI and QRS. The species description is modelled partly on those of Turner (1995) for *Mischarytera* species with amendments to enable accurate venation description.

Species of *Arytera* and *Mischarytera* appear to possess functionally unisexual flowers, with the 'male' and 'female' flowers generally having rudimentary components of the other sex (Turner 1995). Male flowers usually predominate in inflorescences and careful observation is required to ensure that flowers of both sexes are collected. As a result separate descriptions are provided for male (below) and female (not seen at anthesis) flowers.

Venation terminology largely follows Hickey (1973) and Ash *et al.* (1999) with the recognition of a midrib (1° vein order), lateral veins (2° vein order) and intercostal veins (3° and onwards vein orders) within any leaf lamina. When an intercostal vein comprises a continuous raised line of cells it is termed 'distinct'; if it is discontinuous or fades away into the body of the lamina, it is termed 'indistinct'. Indumentum cover is described using the terminology of Hewson (1988), except that 'scattered' is used instead of 'isolated'. The shapes of leaves, sepals and petals are described using the terminology of Hickey & King (2000). Length and width dimensions are indicated as length measurement × width measurement followed by the measurement unit.

Taxonomy

Mischarytera megaphylla P.I.Forst., **species nov.** affinis *M. macrobotryi* sed foliis majora (31–75 cm longitudine contra 14–43 cm), foliolis elliptico-oblongis (adversum elliptica usque obovata) et apicibus caudatis usque longe acuminatis (contra breviter acuminatos), cymulis circinalibus (in illa dichasialibus), pedicellis longioribus (2–4 mm longitudine adversum 1.5–2 mm), floribus masculinis majoribus (2.5–3.5 mm diametro contra 1–1.2 mm) et seminibus majoribus (*c.* 28 × 23–24 mm adversum *c.* 13 × 12 mm) differens. **Typus:** Queensland. Cook District: Cape Tribulation road, 16°09′S, 145°26′E, 21 March 1995, *B.Gray 6026* (holo: QRS; iso: BRI).

Mischarytera sp. (Oliver Creek L.J.Webb+ 10903) in Forster & Jessup (2002).

Sapindaceae sp. (Noah Creek BG 6026) in Hyland *et al.* (2003).

***Illustration*:** Hyland *et al.* (2003).

Trees to 8 m high. Indumentum of simple trichomes, dirty-straw in colour. Branchlets lenticellate, with sparse to dense indumentum when young, glabrescent; flowering twigs 5–6 mm diameter. Leaves 31–75 cm long, 6–8-jugate; petiole 15–24 cm long, pulvinate, sparsely lenticellate; rhachis 29–41 cm long, slightly flattened and somewhat winged to ± rounded; leaflets opposite, subopposite to alternate, petiolules 5–12 × 0.6–1.5 mm, distinctly grooved above, rounded below; lamina coriaceous, elliptic-ovate to elliptic-oblong, rarely slightly falcate, (8–) 11.2–32 × (23–) 4–8.2 cm, length/width ratio 2.2–4.6; apex caudate to long-acuminate; base acute to cuneate, unequal; margin entire, flat to slightly undulating; venation brochidromous, 2° lateral veins 15–21 per side of midrib (1° vein), 3–22 mm apart; upper surface dark green, glossy, venation ± flat and inconspicuous, 2° veins slightly raised towards 1° vein, intercostal veins inconspicuous; lower surface pale green, matt, venation prominent, 2° veins prominently raised, 3° intercostal veins slightly raised to indistinct, 4° intercostal veins reticulate and indistinct. Inflorescences axillary or pseudoterminal; rhachis terete, 3.4–5.7 cm long; first order branches 2–13 cm long, cymules cincinnate, 1–4-flowered; bracts triangular, 0.5–1.2 × 0.2–0.4 mm. Flowers functionally unisexual. Male flowers 2.5–3.5 mm diameter; pedicels filiform, 2–4 × 0.2–0.3 mm, with dense indumentum, bracteoles lanceolate-ovate, 1–2 × 1–1.5 mm, with dense indumentum, margin entire; calyx 0.6–1 mm high, teeth ovate, 0.5–0.8 × 0.7–0.8 mm, externally weakly punctate and with sparse indumentum, margin entire to dentate, apex acute; petals ovate, 0.8–1 × 0.6–0.8 mm, externally weakly punctate with

sparse indumentum in centre, internally with claw 0.3–0.4 mm long, blade not abruptly decurrent into claw, with short indumentum, margin glabrous or with scattered cilia; stamens (7–) 8; filaments 0.7–0.8 mm long, pilose for entire length, denser towards base; anthers 1–1.2 × 0.5–0.7 mm, with sparse indumentum; pistillode *c.* 0.5 mm long, with dense antrorse indumentum; ovary *c.* 0.5 mm long, with dense antrorse indumentum. Female flowers not seen. Fruit capsule slightly obcordate to globose, with 1 well-developed lobe, opening loculifragally, 28–30 mm high, 23–28 mm wide; exocarp smooth, green; endocarp entire, glabrous; stipe 2–4 mm long, glabrous. Seed orbicular-ovoid, *c.* 28 × 23–24 mm, brown; arilloid ± entirely enclosing seed (apart from tip), unwinged (non-alate), fleshy, orange-yellow; hilum ellipsoid *c.* 8 × 6 mm. **Fig. 1.**

***Additional specimens examined*: Queensland.** Cook District: Oliver Creek, a tributary of Noah Creek, Cape Tribulation area, 16°06′S, 145°27′E, Aug 1972, *Webb & Tracey 10903* (BRI); Oliver Creek, V.C.L. Noah, EP/41, Jun 1978, *Sanderson 1549* (QRS); Hewitson property on the southern side of Noah Creek, 16°09′S, 145°26′E, Oct 2002, *Cooper WWC1784* & *Cooper* (BRI); Cape Tribulation road, 16°09′S, 145°26′E, Jul 1995, *Gray 6245* (QRS); *loc. cit.*, Oct 1995, *Gray 6318* (QRS).

***Distribution and habitat*:** *Mischarytera megaphylla* is endemic to the Noah Creek – Oliver Creek area at Cape Tribulation in the Wet Tropics bioregion of north-east Queensland. Plants occur in lowland tropical rainforest (complex mesophyll vineforest) on alluvial/colluvial soils derived from a mixture of metamorphic and mudstone at altitudes below 100 m.

***Notes*:** *Mischarytera megaphylla* has some similiarities to *M. macrobotrys* that occurs in New Guinea and on Cape York Peninsula in Queensland; however it differs noticeably from that species in the much larger leaves (31–75 cm long versus 14–43 cm long) with generally much longer leaflets that are elliptic-ovate to elliptic-oblong (versus elliptic to obovate) and that have a caudate to long-acuminate tip (versus short-acuminate), the cincinnate cymules (versus dichasial), male flowers with longer pedicels (2–4 mm versus 1.5–2 mm) and a greater diameter (2.5–3.5 mm diameter versus 1–1.2 mm diameter), and seeds that are twice as large (28 × 23–24 mm versus *c.* 13 × 12 mm).

Key to Australian *Mischarytera*

1 Leaflets 0.9–3.7 mm wide; lateral (2°) veins in leaflets narrowly spaced (1.5–7 mm apart); fruit capsule 9–19 × 5–20 mm; seeds 6.5–12 × 4.8–8 mm . . . . . **M. lautereriana**

Leaflets 3.3–8.2 mm wide; lateral (2°) veins in leaflets widely spaced (3–22 mm apart); fruit capsule 18–30 × 18–28 mm; seeds 13–28 × 12–24 mm 2

2 Leaves 31–75 cm long; leaflet blade elliptic-oblong to elliptic-ovate, apex caudate to long-acuminate; cymules cincinnate; pedicels 2–4 mm long; male flowers 2.5–3.5 mm diameter; seeds *c.* 28 × 23–24 mm . . . . . **M. megaphylla**

Leaves 14–43 cm long; leaflet blade elliptic to obovate, apex short-acuminate; cymules dichasial; pedicels 1.5–2 mm long; male flowers 1–1.2 mm diameter; seeds *c.* 13 × 12 mm . . . . . **M. macrobotrys**

Mischaryera megaphylla may also occur in the McIlwraith Range as three sterile collections at BRI greatly resemble the material from the Cape Tribulation area (*viz.* headwaters of Massey Creek near old mining site, McIlwraith Range, 13°50'S, 143°20'E, Oct 1969, *Webb & Tracey 9270*; Rocky River, eastern foothills of McIlwraith Range, 13°47'S, 143°25'E, Oct 1969, *Webb & Tracey 9401*; headwaters of Lankelly Creek, western fall of McIlwraith Range, 13°52'S, 143°20'E, Oct 1969, *Webb & Tracey 9570*).

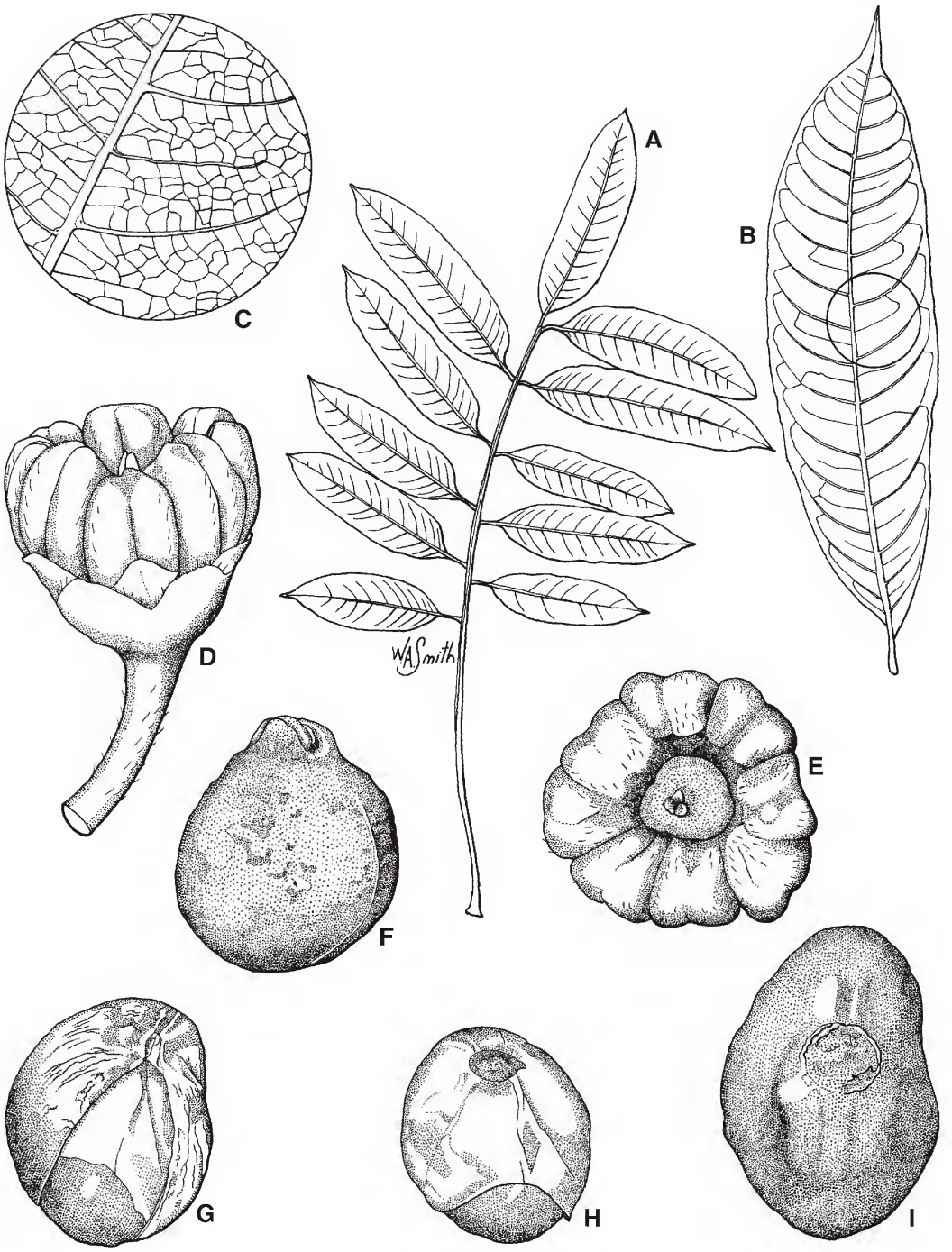

Fig. 1. ***Mischarytera megaphylla.*** A. leaf × 0.3. B. individual leaflet showing 1° and 2° venation × 0.5. C. detail of intercostal 3° and 4° venation × 1.5. D. lateral view of male flower × 12. E. apical view of male flower × 12. F. lateral view of intact fruit × 1. G. lateral view of seed enclosed in arilloid × 1. H. basal view of seed enclosed in arilloid showing point of attachment × 1. I. basal view of seed showing hilum × 1.5. A, *Gray 6245* (BRI); B–E, *Gray 6026* (QRS); F–I, *Gray 6318* (QRS). Del. W. Smith.

If *Mischarytera megaphylla* is truly restricted to the Cape Tribulation area, then it adds to the growing list of narrow or near endemics that are known only from there, *viz. Euodia hylandii* T.G.Hartley, *E. pubifolia* T.G.Hartley and *Gardenia actinocarpa* Puttock.

Conservationstatus: *Mischarytera megaphylla* occurs infrequently at Oliver and Noah Creeks. There is no information as to its occupancy or to the number of individuals that exist and urgent survey work is required to determine its overall distribution and abundance. Although most of its known occurrences are within the Daintree National Park, the species may still warrant conservation coding based on its restricted distribution and apparent small population sizes. It should be regarded as Data Deficient (*cf.* IUCN 2001) at this stage.

***Etymology*:** The specific epithet is derived from the Greek *mega* (big, large) and *phyllus* (leaved) and alludes to the large size of the leaves and leaflets in this species when compared to the other species from Australia.

Acknowledgements

Thanks to W. Smith (BRI) for the illustrations, P.D. Bostock for translation of the diagnosis into Latin, the Australian National Herbarium (QRS) for the loan of material, and the referee for comments on the manuscript.

References

Ash, A., Ellis, B., Hickey, L.J., Johnson, K., Wilf, P. & Wing, S. (1999). *Manual of Leaf Architecture.* Smithsonian Institution: Washington.

Cooper, W. & Cooper, W.T. (1994). *Fruits of the Rain Forest: a guide to fruits in Australian tropical rain forests.* RD Press: Surry Hills.

—— (2004). *Fruits of the Tropical Australian Rainforest.* Nokomis Editions Pty Ltd.: Melbourne.

Forster, P.I. & Jessup, L.W. (2002). Sapindaceae. In R.J.F. Henderson (ed.), *Names and Distribution of Queensland Plants, Algae and Lichens*, pp. 181–185. Environmental Protection Agency: Brisbane.t

Hewson, H. (1988). *Plant Indumentum. A Handbook of Terminology.* Australian Flora & Fauna Series No. 9. Australian Government Publishing Service: Canberra.

Hickey, L.J. (1973). Classification of the architecture of dicotyledonous leaves. *American Journal of Botany* 60: 17–33.

Hickey, M. & King, C. (2000). *The Cambridge Illustrated Glossary of Botanical Terms.* Cambridge University Press: Cambridge.

Hyland, B.P.M., Whiffin, T., Christophel, D.C., Gray, B. & Elick, R.W. (2003). *Australian Tropical Rain Forest Plants. Trees, Shrubs and Vines.* CD-ROM. CSIRO Publishing: Melbourne.

Iucn (2001). *IUCN Red List Categories and Criteria.* Version 3.1. Gland: IUCN – The World Conservation Union.

Turner, H. (1995). Cladistic and biogeographic analyses of *Arytera* Blume and *Mischarytera* gen. nov. (Sapindaceae) with notes on methodology and a full taxonomic revision. *Blumea Supplement 9.* Rijksherbarium/ Hortus Botanicus: Leiden.